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P #9

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/497,967

DATE: 08/15/2001
TIME: 09:27:50

Input Set : A:\23500170101.txt.APP
Output Set: N:\CRF3\08132001\I497967.raw

3 <110> APPLICANT: Clark, Theodore G.
4 Dickerson, Jr., Harry W.
5 Lin, Tian-Long
7 <120> TITLE OF INVENTION: DIAGNOSTIC AND PROTECTIVE ANTIGEN GENE SEQUENCES OF
8 ICHTHYOPHTHIRIUS
10 <130> FILE REFERENCE: 235.00170101
12 <140> CURRENT APPLICATION NUMBER: 09/497,967
13 <141> CURRENT FILING DATE: 2000-02-04
15 <150> PRIOR APPLICATION NUMBER: 60/131,121
16 <151> PRIOR FILING DATE: 1999-04-27
18 <150> PRIOR APPLICATION NUMBER: 60/118,634
19 <151> PRIOR FILING DATE: 1999-02-04
21 <150> PRIOR APPLICATION NUMBER: 60/122,372
22 <151> PRIOR FILING DATE: 1999-03-02
24 <150> PRIOR APPLICATION NUMBER: 60/124,905
25 <151> PRIOR FILING DATE: 1999-03-17
27 <160> NUMBER OF SEQ ID NOS: 102
29 <170> SOFTWARE: PatentIn Ver. 2.1
31 <210> SEQ ID NO: 1
32 <211> LENGTH: 1326
33 <212> TYPE: DNA
34 <213> ORGANISM: Ichthyophthirius multifiliis
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38 gttccatgtc ctgatggta ctttagactcaa gctggattga ctgatgttagg tgctgctgat 120
39 cttggtaattt gtgttaattt cagacctaattt tttaactata atgggtgtgc tgcttaagga 180
40 gaagctaattt gtaattaacc tttcgcagca aataatgctg ctagaggtat atgtgtacca 240
41 tgccaaataaa acagagtagg ctctgttacc aatgcaggtg acttagctac tttagccaca 300
42 taatgcagta cttaatgtcc tactggcaact gcacttgatg atggagtgcac agatgtttt 360
43 gatacatcgcc cgcataatg tggtaatgc aaacctaact tttaactataa tgggtgttct 420
44 ccttaaggta aagctccctgg cgtttaagtt tttgctgctg gtgctgccgc tgcagggttt 480
45 gctgccgtta ctatgttattt tgtagcccttgc caactaaaca aaaacgattt tcctgccact 540
46 gcagggtgcct aagctaattt agccacataa tgtagcaattt aatgtcctac tggcactgt 600
47 cttgtatgtatg gatgtacact tggttttat acatcagcca cattatgtgt taaatgcaga 660
48 ccttaactttt actataatgg tggttcttcc taaaggtaag ctccctggcgt ttaagttttt 720
49 gctgctggta ctgcccgtgc aggtgttgct gcccgttacta gttaatgtgt accttgccaa 780
50 ataaacaaaa acgatttcc tggccactgca ggtgcctaaat ctaatgttgc cacataatgc 840
51 agtacttaat gtccaaactgg cactgcaattt caagacggag tgacacttgtt ttttagtaat 900
52 tcatccacat aatgttctta atgcattgtt aattactttt ttaatgttaa ttgcgaagca 960
53 ggtaaaagtt aatgtttaaa gtgtccagta agtaaaacta ctccagcaca tgctccaggt 1020
54 aatactgcta cttaaaggccac ataaatgtttt accacatgtc ctgctggtaat agtacttgtat 1080
55 gatggaaatcat caactaattt tggtagcttcc gcaactgaat gtactaaatg ttctgctggc 1140
56 ttttttgcattt caaaaacaac tggttttaca gcaactgttgc atacatgtac tgaatgtact 1200
57 aaaaaattaa cttctggtgc cacagctaaa gtatatgtca aagctactca aaaagtataa 1260
58 tgcgcctcca ctactttcgc taaatttta tcgatttcct tattatttat ttcttctat 1320
59 ttatttg 1326
62 <210> SEQ ID NO: 2

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63 <211> LENGTH: 2486
64 <212> TYPE: DNA
65 <213> ORGANISM: Ichthyophthirius multifiliis
67 <400> SEQUENCE: 2
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69 tttaaataaa ttataaaaaa taaaagtag aaaaatatac ataataaaaataaa 120
70 tttaaaaatt atttatgatt tgTTTTtaga aaataaggTT ttatTTataa taatgaattc 180
71 tttaaataat gaatcgatat tatataaatt tttatTTTT ataaaatattt gaattaccta 240
72 aaataatata aatttatgaa atattatTTT aaataataag ttatagaata aatttatttt 300
73 tatttctaat ttTTTTata attttaaaa aaaaaaaaaa aatctattac tattttgcat 360
74 ttacaaacga tagaaaaaaac taaaatttat aatattata aaaaaaaaaa tataaataat 420
75 aataataaaa atatgaaata taatattttt ttaattttaa ttatTTCTT atttattataat 480
76 gaattaagag ctgttccatg tcctgatggT acttagactc aagctggatt gactgatgta 540
77 ggtgctgctg atcttggTac ttgtgttaat tgcagaccta attttacta taatggTggT 600
78 gctgcttaag gagaagctaa tggtaattaa ctttgcag caaataatgc tgctagaggt 660
79 atatgtgtac catgccaat aaacagagta ggctctgtta ccaatgcagg tgacttagct 720
80 acttttagcca cataatgcag tacttaatgt cctactggca ctgcacttga tgatggagtg 780
81 acagatgtt ttgatagatc agccgcataa tggTTaaat gcaaaccTaa cttttactat 840
82 aatggTggTT ctccttaagg tgaagctcct ggcgtttaag ttttgcTgc tggtgctgCc 900
83 gctgcaggTg ttgctgcccT tactagttaa tggTtacctt gccaactaaa caaaaacgat 960
84 tctcctgcca ctgcaggTgc ctaagctaat ttagccacat aatgttagcaa ttaatgtcct 1020
85 actggcactg tacttgatga tggagtgaca ctgtttta atacatcagc cacattatgt 1080
86 gttaaatgca gacctaactt ttactataat ggtggTtCt cttaaaggTga agetcctggc 1140
87 gtttaagttt ttgctgctgg tgctgcccgt gcaggTgttgc tggccgttac tagttatgt 1200
88 gtaccttgcc aaataaaacaa aaacgattct cctgcccactg caggTgccta agctaattta 1260
89 gccacataat gcagtaactt atgtccaaactt ggcactgca ttcaagacgg agtgacactt 1320
90 gtttttagta attcatccac ataatgttct taatgcattt ctaattactt ttttaatggT 1380
91 aatttcgaag caggtaaaag ttaatgttta aagtgtccag taagtaaaac tactccagca 1440
92 catgtccag gtaataactgc tacttaagcc acataatgtt tgaccacatg tcctgctggT 1500
93 acagtaactg atgatggAAC atcaactaat tttgtagctt ccgcaactga atgtactaaa 1560
94 tgTTCTgCTg gcttttttgc atcaaaaaaca actggTTta cagcaggTac tgatacatgt 1620
95 actgaatgt aaaaaaaattt aacttctggT gccacagcta aagtataatgc tgaagctact 1680
96 caaaaagtat aatgcgcctc cactactttc gctaaatttt tatcgatttC cttattattt 1740
97 atttcttctt atttattgtg atgaataaaa taattcataat tttttatTTT ttttatttt 1800
98 tgTTTataaa ttaaaaaaaata gataaaaattt aaaatataattt aaaaataattt ttttatataa 1860
99 attatcaatt aacaactaac taacaaaata caattaaaat ctttatagaa ggtttttctt 1920
100 tataatattt taaggattaa ttacaaattt ttaattaaag taacattttt tcattttaaa 1980
101 tcttattaaa ataaatacat aaattctgt tgatttttt ttaatattaa ttAAAattt 2040
102 gaataaaaaa atatgtttta agtaaataaa agaagaaattt taatttaattt tattttatatt 2100
103 taatttaata ttattttat ttatTTcgA atattttttt atcaaacttt taaaactaaa 2160
104 aatttattaa gtctaattta aactatataat attatattat tttgtattct ttttttttt 2220
105 cataatcata aatacagaat ttTTTatTTT ttgaggTgtg catattttt tatgaatgtt 2280
106 atcacttata tatgcgtatg taattttattt tatctcattc agggcttaag cttgtaaaat 2340
107 aataatattc aatataattt ttaaggAAA ggttaggcaaa actaaactaa attttttaac 2400
108 aaaaatataat caattacaaa aatattttt tataaataatgaa tgaataaaaaa tagtattttt 2460
109 atttattttt aacactaaaaa gaattc 2486
112 <210> SEQ ID NO: 3
113 <211> LENGTH: 1404
114 <212> TYPE: DNA

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115 <213> ORGANISM: Ichthyophthirius multifiliis
 117 <400> SEQUENCE: 3
 118 atgaaaaata atattttagt aatattgatt atttcattat ttatcaatta aattaaatct 60
 119 gctaattgtc ctgttggAAC tgaaactaac acagccggat aagttgatga tcttaggaact 120
 120 cctgaaatt gtgttaattt ttagaaaaac ttttattata ataatgtgc tgctttcgTT 180
 121 cctgggtcta gtacgtgtac accttgcTca taaaaaaaaaag atgctggTgc ttaaccaaAT 240
 122 ccacctgcta ctgctaattt agtcacataa tgtaacgtta aatgcctgc tggTaccgca 300
 123 attgcaggTg gagcaacaga ttatgcagca ataatcacag aatgtgtta ttgtagaatt 360
 124 aatttttata atgaaaatgc tccaaatttt aatgcaggTg ctatgcacatg cacagcttgc 420
 125 ccggtaaaaca gagttggTgg tgcatgtact gctggtaatg ccgcTaccat agtgcataa 480
 126 tgtaacgtcg catgtcctac tggTactgca ctTgatgtatg gagtaactac tgattatgtt 540
 127 agatcattca cagaatgtgt taaatgtaga cttaacttt actataatgg taataatggT 600
 128 aatactcTTt tcaatccagg taaaagttaa tgcaacacTTt gtccggcaat taaacctgct 660
 129 aatgttgctt aagctacttt aggtaatgtat gctacaataa ccgcataatg taacgttgca 720
 130 tgccctgatg gtactataag tgctgctggA gtaaataatt gggtagcaca aaacactgaa 780
 131 tggTactaattt gtgctcctaa ctTTTacaat aataatgtc ctaatttcaa tccaggtaat 840
 132 agtacatgcc tacTTTgccc agcaaaataaa gattatggTg ctgaaggccac tgcaggTggT 900
 133 gccgctactt tagccaaata atgtaatattt gcatgcccTg atggTactgc aattgtctgt 960
 134 ggagcaacta attatgtataattataaaca gaatgtctaa attgtgctgc taactttat 1020
 135 tttgatggta ataatttcta ggcaggaaatg agtagatgc aagcatgtcc agcaaaataaa 1080
 136 gTTtaaggcg ctgttagcaac tgcaaggTggT actgtacttt taattgtcata atgtccctt 1140
 137 gaatgcccTg ctggTactgt actcaccgat ggaacaacat ctacttataa ataagcagca 1200
 138 tctgaatgtg ttaaatgtgc tgccaacttt tataactaca aataaactga ttggtagca 1260
 139 ggtattgata catgtacttag ttgtaataaaa aaattaactt ctggcgtgca agctaattt 1320
 140 cctgaatctg ctaaaaaaaaa tatataatgt gattcgcta atttttatac aatttcctta 1380
 141 ttattgtattt ctTatttattt atta 1404
 144 <210> SEQ ID NO: 4
 145 <211> LENGTH: 100
 146 <212> TYPE: DNA
 147 <213> ORGANISM: Ichthyophthirius multifiliis
 149 <400> SEQUENCE: 4
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 151 ttTatcgatt tccttattat ttatttctt ctatttattt 100
 154 <210> SEQ ID NO: 5
 155 <211> LENGTH: 1404
 156 <212> TYPE: DNA
 157 <213> ORGANISM: Artificial Sequence
 159 <220> FEATURE:
 160 <223> OTHER INFORMATION: Description of Artificial Sequence: synthetic
 161 55kD i-antigen coding region
 163 <400> SEQUENCE: 5
 164 atgaagaaca acatcctggT gatcctgtatc atctctctgt tcataacca gatcaagtct 60
 165 gctaactgtc ctgttggAAC cgagaccaac accgctggac aggtggacga cctgggaacc 120
 166 cctgctaact gtgtgaactg tcagaagaac ttctactaca acaacgtgc tgctttcgTg 180
 167 cctggagctt ctacctgtac cccttgcTct cagaagaagg acgctggagc tcagcctaac 240
 168 cctcctgcta ccgctaacctt ggtgacccag tgtaacgtga agtgcctgc tggAACCGCT 300
 169 atcgctggag gagctaccga ctacgtgtct atcatcaccg agtgtgtgaa ctgtcgcatc 360
 170 aacttctaca acgagaacgc tcctaacttca aacgctggag ctTctacctg taccgcttgc 420
 171 cctgtgaacc gcgtggagg agctctgacc gctggaaacg ctgctaccat cgtggctcag 480

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172 tgtaacgtgg cttgtctac cggAACGCT ctggacgacg gagtgaccac cgactacgtg 540
 173 cgctttca ccgagtgtgt gaagtgtcgc ctgaacttct actacaacgg aaacaacgga 600
 174 aacaccctt tcaaccctgg aaagtctca gttacccctt gtcctgctat caagcctgct 660
 175 aacgtggctc aggctaccctt gggAAACGAC gctaccatca ccgctcagtg taacgtggct 720
 176 tgcctgacg gaaccatctc tgctgctgga gtgaacaact ggggtggctca gaacaccgag 780
 177 tgcctcctaa cttctacaac aacaacgctc ctaacttcaa ccctggaaac 840
 178 tctacctgtc tgcctgtcc tgctacaacaa gactacggag ctgaggctac cgctggagga 900
 179 gctgctaccc tggctaagca gtgtaacatc gcttgcctg acggaacccgc tategcttct 960
 180 gagctacca actacgtgat cctgcagacc gagtgtctga actgtgtcgc taacttctac 1020
 181 ttcgacggaa acaacttcca ggctggatct tctcgctgta aggcttgcc tgctaacaag 1080
 182 gtgcaggag ctgtggctac cgctggagga accgctaccc tgatcgctca gtgtgctcg 1140
 183 gagtgccctg ctggaaccgt gctgaccgac ggaaccacct ctacctacaa gcaggctgct 1200
 184 tctgagtgtg tgaagtgtgc tgctacttc tacaccacca agcagaccgaa ctgggtggct 1260
 185 gaaatcgaca cctgtaccc ttgtaacaag aagctgaccc ctggagctga ggctaaccctg 1320
 186 cctgagtctg ctaagaagaa catccagtgacttcgtacttctctg tatctctctg 1380
 187 ctgctgatct cttaactaccc gctg 1404
 190 <210> SEQ ID NO: 6
 191 <211> LENGTH: 442
 192 <212> TYPE: PRT
 193 <213> ORGANISM: Ichthyophthirius multifiliis
 195 <400> SEQUENCE: 6
 196 Met Lys Tyr Asn Ile Leu Leu Ile Leu Ile Ile Ser Leu Phe Ile Asn
 197 1 5 10 15
 199 Glu Leu Arg Ala Val Pro Cys Pro Asp Gly Thr Gln Thr Gln Ala Gly
 200 20 25 30
 202 Leu Thr Asp Val Gly Ala Ala Asp Leu Gly Thr Cys Val Asn Cys Arg
 203 35 40 45
 205 Pro Asn Phe Tyr Tyr Asn Gly Gly Ala Ala Gln Gly Glu Ala Asn Gly
 206 50 55 60
 208 Asn Gln Pro Phe Ala Ala Asn Ala Ala Arg Gly Ile Cys Val Pro
 209 65 70 75 80
 211 Cys Gln Ile Asn Arg Val Gly Ser Val Thr Asn Ala Gly Asp Leu Ala
 212 85 90 95
 214 Thr Leu Ala Thr Gln Cys Ser Thr Gln Cys Pro Thr Gly Thr Ala Leu
 215 100 105 110
 217 Asp Asp Gly Val Thr Asp Val Phe Asp Arg Ser Ala Ala Gln Cys Val
 218 115 120 125
 220 Lys Cys Lys Pro Asn Phe Tyr Tyr Asn Gly Gly Ser Pro Gln Gly Glu
 221 130 135 140
 223 Ala Pro Gly Val Gln Val Phe Ala Ala Gly Ala Ala Ala Gly Val
 224 145 150 155 160
 226 Ala Ala Val Thr Ser Gln Cys Val Pro Cys Gln Leu Asn Lys Asn Asp
 227 165 170 175
 229 Ser Pro Ala Thr Ala Gly Ala Gln Ala Asn Leu Ala Thr Gln Cys Ser
 230 180 185 190
 232 Asn Gln Cys Pro Thr Gly Thr Val Leu Asp Asp Gly Val Thr Leu Val
 233 195 200 205
 235 Phe Asn Thr Ser Ala Thr Leu Cys Val Lys Cys Arg Pro Asn Phe Tyr
 236 210 215 220

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238 Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Val Gln Val Phe
 239 225 230 235 240
 241 Ala Ala Gly Ala Ala Ala Gly Val Ala Ala Val Thr Ser Gln Cys
 242 245 250 255
 244 Val Pro Cys Gln Ile Asn Lys Asn Asp Ser Pro Ala Thr Ala Gly Ala
 245 260 265 270
 247 Gln Ala Asn Leu Ala Thr Gln Cys Ser Thr Gln Cys Pro Thr Gly Thr
 248 275 280 285
 250 Ala Ile Gln Asp Gly Val Thr Leu Val Phe Ser Asn Ser Ser Thr Gln
 251 290 295 300
 253 Cys Ser Gln Cys Ile Ala Asn Tyr Phe Phe Asn Gly Asn Phe Glu Ala
 254 305 310 315 320
 256 Gly Lys Ser Gln Cys Leu Lys Cys Pro Val Ser Lys Thr Thr Pro Ala
 257 325 330 335
 259 His Ala Pro Gly Asn Thr Ala Thr Gln Ala Thr Gln Cys Leu Thr Thr
 260 340 345 350
 262 Cys Pro Ala Gly Thr Val Leu Asp Asp Gly Thr Ser Thr Asn Phe Val
 263 355 360 365
 265 Ala Ser Ala Thr Glu Cys Thr Lys Cys Ser Ala Gly Phe Phe Ala Ser
 266 370 375 380
 268 Lys Thr Thr Gly Phe Thr Ala Gly Thr Asp Thr Cys Thr Glu Cys Thr
 269 385 390 395 400
 271 Lys Lys Leu Thr Ser Gly Ala Thr Ala Lys Val Tyr Ala Glu Ala Thr
 272 405 410 415
 274 Gln Lys Val Gln Cys Ala Ser Thr Thr Phe Ala Lys Phe Leu Ser Ile
 275 420 425 430
 277 Ser Leu Leu Phe Ile Ser Phe Tyr Leu Leu
 278 435 440
 281 <210> SEQ ID NO: 7
 282 <211> LENGTH: 468
 283 <212> TYPE: PRT
 284 <213> ORGANISM: Ichthyophthirius multifiliis
 286 <400> SEQUENCE: 7
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 290 Gln Ile Lys Ser Ala Asn Cys Pro Val Gly Thr Glu Thr Asn Thr Ala
 291 20 25 30
 293 Gly Gln Val Asp Asp Leu Gly Thr Pro Ala Asn Cys Val Asn Cys Gln
 294 35 40 45
 296 Lys Asn Phe Tyr Tyr Asn Asn Ala Ala Ala Phe Val Pro Gly Ala Ser
 297 50 55 60
 299 Thr Cys Thr Pro Cys Pro Gln Lys Lys Asp Ala Gly Ala Gln Pro Asn
 300 65 70 75 80
 302 Pro Pro Ala Thr Ala Asn Leu Val Thr Gln Cys Asn Val Lys Cys Pro
 303 85 90 95
 305 Ala Gly Thr Ala Ile Ala Gly Gly Ala Thr Asp Tyr Ala Ala Ile Ile
 306 100 105 110
 308 Thr Glu Cys Val Asn Cys Arg Ile Asn Phe Tyr Asn Glu Asn Ala Pro
 309 115 120 125

VERIFICATION SUMMARY
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Input Set : A:\23500170101.txt.APP
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L:735 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:31
L:754 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:32
L:793 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:33
L:796 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:33
L:799 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:33
L:802 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:33
L:820 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:34
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